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Measuring Menopause:

Tracking Mid-Life Health Risks

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Editors:
Cheryl Janusz
Marie Mahoney

Associate Editor:
Maggie Kennedy

Assistant Editor:
Audrey Nagelberg

Writers:
Barbara Harfmann
Steve Noe
Lisa Spengler

Editorial Assistant:
Lisa Spengler

Design and Art Direction:
Brierton Design

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Jack R. Bohlen
Vice President

Ellen M. Hunt
Director of Publications

Rush-Presbyterian-St. Luke's Medical Center
1700 West Van Buren, Suite 250
Chicago, IL 60612

For additional information on any of the articles in this issue, please call (312) 942-5580.

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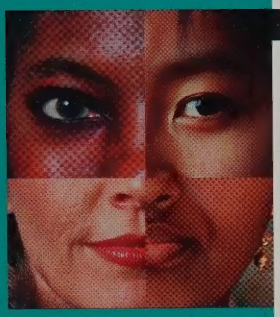

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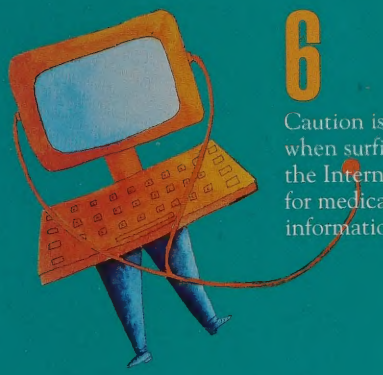
Researchers are studying the health of women of various ethnic backgrounds as they approach menopause.



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TRACKING MID-LI

by Maggie Kennedy

If a man is predisposed to heart disease, his arteries may begin to clog with fatty deposits before he leaves his teens. This blockage grows worse with each passing year. By the time he turns 50, the man's arteries may be severely clogged, making him a likely candidate for a heart attack.

By comparison, his wife's arteries usually stay as clean as a young girl's until her early 40s, even if she too has inherited a susceptibility to heart disease. The difference: Women produce significantly more estrogen, a hormone that plays an essential role in the female reproductive cycle.

Estrogen's powerful protective effect becomes clear when the woman hits mid-life and goes through the menopausal transition — the four-year period when her reproductive capabilities diminish. During this time, the woman's ovaries slowly stop producing estrogen. By age 50, a few years after her last menstrual period, the woman's arteries are as clogged as her husband's.

"For a man, it takes a whole lifetime to develop heart disease. But for a woman, it only takes the years of her menopausal transition," says Lynda Powell, PhD, director of epidemiology in Rush's Department of Preventive Medicine.

A woman's risk for other diseases also rises dramatically during menopause, says Powell. Cholesterol and blood pressure go up, bones become more brittle and breast cancer becomes a greater threat. Many women also complain of less serious — but troublesome — problems, such as aching joints, hot flashes, insomnia and mood swings.

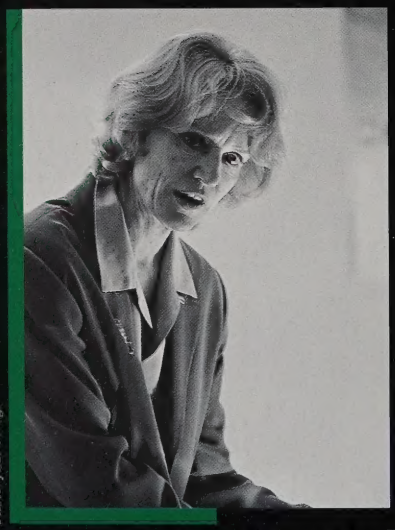

Photo: Jean Clough

Lynda Powell, PhD, is the principal investigator of the Women in the South Side Health (WISH) Project.

The startling difference between the way men and women age and develop major diseases has been known for several decades, says Powell. But, until recently, menopause has been a mute subject in the medical community, as well as society at large. Few medical studies have examined what happens to women during the menopausal transition — known as perimenopause — or looked for ways to prevent the potentially deadly health risks the transition brings.

FE HEALTH RISKS

"Until now, funding for healthcare research has been directed toward men and younger women," says Powell. "We have virtually neglected the health of women who are beyond the childbearing years. This is particularly true for women of color."

Rush is helping to change this by participating in a national study, sponsored by the National Institutes of Health, tracking the health of 3,200 women of various ethnic backgrounds as they go through the menopausal transition. Researchers at the Rush site, called the Women in the South Side Health (WISH) Project, are studying black and white women from the Beverly and Morgan Park neighborhoods on Chicago's South Side.

Photo: Jean Clough

Women attend one of the monthly educational programs on menopause offered by the WISH project.

To recruit women into the study, researchers are randomly interviewing women between the ages of 40 and 55. Those between 42 and 52 who still have regular menstrual periods are then invited to participate in the long-term study.

The point is to recruit women before they show any physical signs of perimenopause, such as irregular periods or hot flashes, explains Powell, who is also the study's principal investigator. Researchers will then study these women for four years, tracking the physical, psychological and social changes they experience as they approach and enter menopause.

To identify these changes, participants undergo an assessment that provides researchers with a baseline picture of their physical and psychological health, explains Deidre Wesley, MPA, project director. Researchers ask participants dozens of questions about their medical history and lifestyle, from medications taken and menstrual cycle patterns, to eating habits and psychiatric history. Researchers then measure each woman's blood pressure, cholesterol, dietary fat and estrogen levels. Participants' strength and mobility are also tested, as well as their thinking capabilities. They climb stairs, read numbers backwards, and perform other physical and mental exercises.

"I hope the study will tell me a lot about what's going on with me," says Mary-Lynn Wilson, a 46-year-old participant who has not experienced any obvious signs of perimenopause yet. "There's so much contradictory information out there. I thought I could clear up some things." She also hopes the study will help in her job as a personal trainer. She plans to pass on useful information to her clients, who are primarily middle-aged women like herself.

Constance Shabazz, MD, decided to participate for professional reasons as well. The 44-year-old internist cares for many middle-aged women who are coping with menopause as well as other stresses. "Many of the women I'm dealing with are going through a divorce or going through the parenting cycle again because they're taking care of grandchildren. Others have financial problems or job problems. Then menopause gets added to the stew and they ask, 'Why am I being cursed?'"

Wilson and Shabazz completed their baseline assessments in 1996. They will return for follow-up assessments once a year for the next four years. This will allow researchers to identify any changes Wilson and Shabazz experience as they progress through perimenopause.

Researchers already know that certain changes occur in a woman's biological makeup as she goes through perimenopause. For instance, as she gradually stops producing estrogen, the

Photo: Bruce Powell

Study participant Mary-Lynn Wilson, who is a personal trainer, advises client Judy O'Neill.

cholesterol levels in her body change, says Powell. Until age 40, women have high levels of high-density lipoproteins (HDL) in their blood streams and low levels of low-density lipoproteins (LDL). HDL is often called "good cholesterol" because it protects against heart disease by keeping arteries clean of fatty deposits. But during perimenopause, a woman's HDL cholesterol goes down, and her LDL levels go up, increasing her risk of heart attack.

By closely monitoring cholesterol levels and other physical measures, researchers hope to identify innovative treatments for heart disease and other conditions that women develop at mid-life, Powell says.

For instance, Powell is studying the effectiveness of a simple therapy for reducing a woman's health risks at mid-life: gaining a few extra pounds. Interestingly, heavier women store a form of estrogen, called estrone, in their fat cells, that continues to provide protection against heart disease, osteoporosis and other conditions.

"This suggests that the healthiest lifestyle for women as they age may be to let themselves gain a few pounds," says Powell. Exactly how much weight women should gain is still under investigation. But Powell warns that women should stop at a few extra pounds. Obesity substantially increases a

"It will be really interesting to see if menopause has a color. I am excited to see how women of different ethnicities perceive aging and menopause and how that affects their health."

woman's risk for developing diabetes, heart disease and other conditions.

The study should also shed new light on hormone replacement therapy, a commonly prescribed treatment that replaces the natural estrogen women lose during menopause. The benefits of hormone replacement therapy are well documented: It significantly reduces a woman's risk of developing osteoporosis and heart disease. But the therapy is still controversial. Some studies have shown that it increases the risk of breast and ovarian cancer.

"Women have a lot of questions about whether they should go on hormone replacement therapy or not," says Powell. "One of the things the study could contribute is to help women make better, informed choices about going on the therapy."

Another primary goal is to identify how women of different ethnic groups experience menopause. "It will be really interesting to see if menopause has a color," says Wesley. "I am excited to see how women of different ethnicities perceive aging and menopause and how that affects their health."

At the Rush site, Powell and her team have already uncovered some interesting differences between black and white women. For instance, white participants are more likely to use hormone replacement therapy. Thirteen percent of white participants use hormones, compared to 5 percent of black participants.

Black women, on the other hand, are much more likely to have had hysterectomies: 29 percent compared to only 11 percent of white participants.

"How do we explain these big differences in practices?" asks Powell. "Are these medical issues, socioeconomic issues or cultural issues?" The answers should become clear as the study progresses, she says.

Another mystery researchers hope to solve is when perimenopause begins and how long it lasts. Past studies have concluded that the transition typically begins around age 46 in white women and lasts for about four years. This study will attempt to confirm this and see if black women have a similar experience. Preliminary evidence suggests that black women begin the transition about one to two years earlier.

Knowing when to expect perimenopause will help women anticipate and cope with many of the disturbing symptoms, Powell says. "Perimenopause is more difficult if women think: 'I'm losing my mind, or I've got aches and pains so I'm on my way to arthritis,'" she says. "It's a whole different experience to realize that aches and pains, sleep problems and mood swings

Photo: Jean Clough

Project director Deidre Wesley, MPA (center), talks with two study participants.

can be hormonally induced." Knowing that these symptoms will eventually go away — one or two years after menopause — also helps women cope, says Powell.

Study participant Wilson agrees that one of the most confusing things about perimenopause is not knowing whether it has begun or not. "The other night I was sweating in my sleep. But I didn't know if I was sweating because I was warm, or because I'm starting menopause and was having night sweats."

She's anxiously awaiting the results of her initial assessment. This will tell her whether her estrogen levels are falling, indicating that she's entering perimenopause.

Powell is also investigating whether lifestyle factors make a difference. For instance, she is studying whether women who have a lot of stress in their lives have a higher chance of developing perimenopausal symptoms, heart disease and other conditions. At the same time, she hopes to identify "cushioning factors" that help women cope effectively with menopause and other stressful life events. Powell believes that a positive attitude toward aging is one such cushioning factor.

"No matter how young you are, you're ultimately going to get older, and your looks will change," she says. "If your whole self-esteem is based on valuing yourself for external reasons, such as youth and beauty, the menopausal transition will be a tough time. Women who value more enduring qualities, like strength of character and interpersonal relationships, are likely to fare better."

"If your whole self-esteem is based on valuing yourself for external reasons ... the menopausal transition will be a tough time."

The news is full of stories about the negative side of menopause: how women become depressed and suffer from mood swings and night sweats. To counteract these stereotypes, Powell hopes to identify women who exemplify what it means to age with grace and style.

"We're hoping to find examples of women who don't follow what I call the 'Hollywood starlet' mode of aging," Powell says. "We're looking for the opposite kind of woman. Women who have strong internal characters and whose spirits continue to emerge and grow stronger as they age."

Shabazz agrees that a positive approach to aging puts a whole new slant on menopause. "Right now, I'm in the best part of my life," she says. "It may be the most challenging. But at my age, I have so much more experience than I used to. I have the tools to deal with whatever comes my way." ■

Constance Shabazz, MD, another WISH participant, walks with her son, Muhammad, near their Beverly home.

Photo: Bruce Powell

A woman wakes up sneezing, eyes itching, head congested. She looks outside and sees that the magnolia tree in her yard has begun to flower. Refusing to have another spring ruined by pollen, the woman shuffles over to her computer, logs onto the Internet and conducts a search on "hayfever relief."

SURFING CYBERSPACE FOR HEALTH ADVICE

She turns up 7,800 sources, everything from the "American Association of Immunology" to "Granny's Herbal Garden."

Three hours later, her eyes now bloodshot from staring at the computer, the woman has read about dozens of "cures" for hayfever — from air filters and allergy shots to acupuncture and homeopathy. She flicks off the computer, blows her nose and decides that being an informed healthcare consumer is just as confusing as living in the dark.

by Maggie Kennedy

"Using the Internet is like going to the library, except it's a lot bigger," says Anthony Cutilletta, MD, an Internet advocate and co-director of the Rush Children's Heart Center. "You not only have what's written in textbooks and journals, you also have opinions of people. So it's a much broader environment to get involved in."

Cutilletta and other Net-savvy clinicians point to the advantages of looking up health information on the Web. For one, consumers don't have to leave their homes, which is particularly appealing when someone is too sick to drive to the library. The information on the Web is also more up to date. People post information every day, while medical books and journals typically sit on library shelves for months or years.

Another advantage is that people can share information and concerns with other consumers and health-care professionals. For instance, a woman diagnosed with diabetes can join a diabetes news group and automatically receive the latest information about the disease. She can also join an on-line support group and share stories, advice or even recipes with other diabetics.

"Medicine as a profession deals with mysterious sorts of things," says Laurens Ackerman, MD, director of medical informatics at Rush. "Consumers are often dealing in a void. The Internet gives people more access to information."

But easier access brings certain risks, physicians acknowledge. "The No. 1 problem is that information is not screened," says Steven Rothschild, MD, associate chairman, Department of Family Medicine. "When you pick up a medical journal, you know it has been peer reviewed. When an article is in the newspaper, there's a byline, and there's been fact-checking. But on a Web page, you don't really know who's standing behind that information."

Caution while surfing is the advice offered by Rush physicians. "You need to take certain things with a grain of salt, depending on the source," says Rothschild. Information provided by a hospital or medical associa-

Linking to Patients

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`http://www.rush.edu`

Look up Rush's home page, and you'll find lots of information of interest to healthcare consumers:

- **Help finding the right physician for you. Click on "Rush Physician Referral Service," and you'll be connected to staff who can help you locate a family doctor or a specialist at Rush. They can also give you details about a physician's medical education and training, office hours, locations, insurance plans accepted and more.**
- **Detailed information about specific diseases or conditions. For example, parents of children with heart disease can click on the Rush Children's Heart Center and view a diagram of a normal heart or read informative articles on such topics as heart murmurs.**
- **Coming soon: Information on various health topics, including women's health, aging and senior health, arthritis and orthopedics, children's health, and infectious diseases such as AIDS. Under each of these, you'll find informational articles, health tips and links to related sites on the Web.**

Rush's home page address is: http://www.rush.edu

Or, if you have questions, you can e-mail Heather Reid, Rush's Internet coordinator, at hreid@rush.edu

"On a Web page, you don't really know who's standing behind that information."

tion, such as the American Medical Association, is obviously more credible than advice posted on "Bob's Home Page," he says.

But even an MD after an author's name is not a guarantee that he or she is an expert on a particular health condition, says Cutilletta. The best way to find out is to check the author's credentials, he says. For example, is the physician board-certified in a particular field? Has he or she been recognized by a specialty society in that field? If the author's credentials aren't included, try asking these questions via e-mail.

Another tip is to remember that general healthcare advice does not always apply to an individual. "You are an individual with a specific mix of risk factors and problems," says Rothschild. "Something that might be recommended for patients with hypertension may not be recommended for you if you have hypertension and diabetes."

He advises people to talk to their doctors before trying any new treatment advocated on the Internet, or elsewhere. "Your physician is in the best position to personalize the scientific literature to you as an individual," Rothschild says.

When people run questions and concerns by their doctors it also helps create the vital one-on-one exchange between doctor and patient. "Informed patients are very good patients," says Rothschild. "They can develop much more effective partnerships with their doctors." ■

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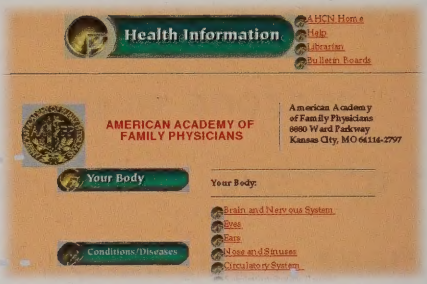

The Virtual Hospital™
http://www.vh.org/

The Health Gazette
http://www.freenet.scri.fsu.edu/HealthGazette/gazette.html

Louisiana State University
http://lib-sh.lsumc.edu: 80/fammed/pted/pted.html

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DEPARTMENT OF HEALTH & HUMAN SERVICES
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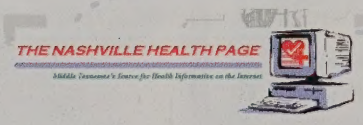

The Nashville Health Page
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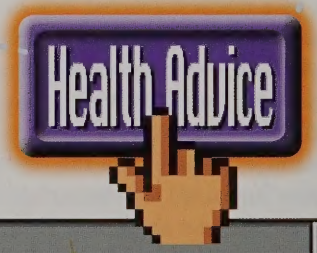
Medsite Navigator
http://www.MedsiteNavigator.com/



A Brighter Future

Promising drug helps patients with rare heart disease

Amie Weber takes a deep breath as she reaches for the hand of her 10-year-old son, Tyler. They are going for a walk around their neighborhood in Bellevue, Iowa. As she greets the mail carrier, waves to her next-door neighbor and talks with her son about school, Weber remembers all of the times she was too ill to enjoy simple pleasures like these.

■ by Audrey Nagelberg

In 1995, just weeks before Christmas, Weber was rushed three hours by ambulance from Dubuque Hospital to a Chicago hospital in a state of cardiogenic shock — her heart barely pumping enough blood to keep her alive. More than a year of inadequate treatment for a rare form of heart disease, primary pulmonary hypertension, had taken its toll on the 27-year-old. By the time Weber arrived in Chicago, her breathing had become light and shallow. She had retained more than 50 pounds of water, and her skin had turned blue.

Because primary pulmonary hypertension is so rare, Weber was referred to Rush cardiologist Stuart Rich, MD, one of the nation's experts in treating this potentially lethal condition.

Three weeks later, after being treated by Rich with a breakthrough drug called prostacyclin, Weber walked out of the hospital hand-in-hand with her husband, D.J. She could look forward to going home to Iowa and finally exchanging Christmas presents with her family and friends. "I hadn't felt that good in a long time," she says.

Weber credits the turnaround in her condition to the combination of Rich's expertise in treating primary pulmonary hypertension and his work with the drug prostacyclin. "The first time I learned about Dr. Rich and his study of prostacyclin was in a magazine article I happened to be reading while visiting my husband's aunt in Louisiana," Weber recalls. "I had been diagnosed in 1994, but was having a hard time finding information. I was so excited to see this article that I faxed it to my doctor back in Iowa."

Only a handful of physicians nationwide know much about primary pulmonary hypertension, a condition that affects only two people in every million. Pulmonary hypertension occurs when blood pressure in the arteries that

Photo: Maureen Panella

Amie Weber on her farm in Iowa. Thanks to an innovative treatment, Weber is able to enjoy life again.

"What's exciting now, however, is that... show that the drug can cause th...

supply blood to the lungs becomes abnormally high. This usually results from a thickening of the arteries, which in turn restricts blood flow. To maintain an adequate blood flow, the right side of the heart, which pumps blood to the lungs, must contract more vigorously than it had to before. This causes the heart's muscle wall to become enlarged, which eventually leads to heart failure.

Pulmonary hypertension can be caused by a variety of lung and cardiovascular diseases. If the underlying cause can be addressed, doctors may be able to treat the pulmonary hypertension satisfactorily. But in Weber's case, doctors could not find an underlying cause, so she was diagnosed with primary pulmonary hypertension. This form of the condition is usually more difficult to treat.

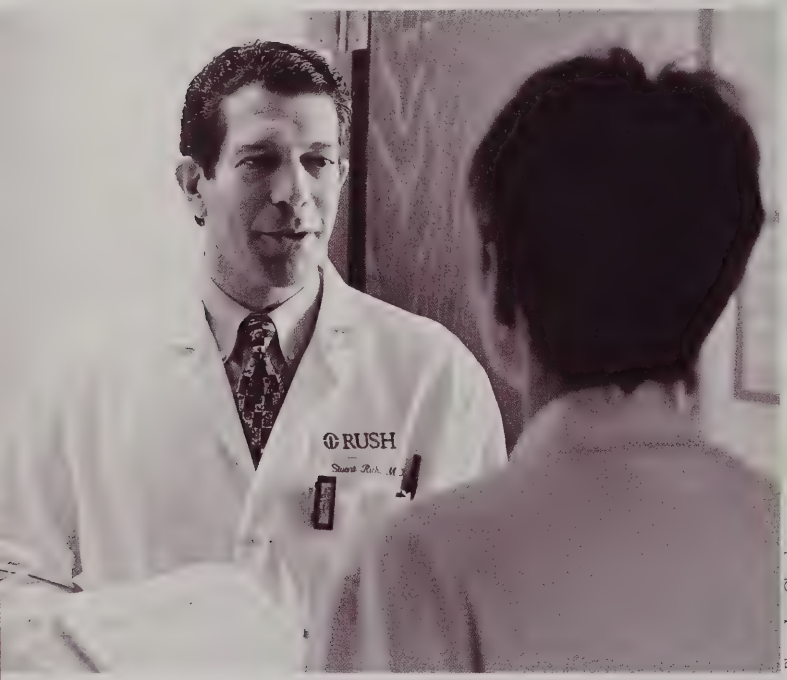


Photo: Jean Clough

Rush cardiologist Stuart Rich, MD, is a nationally known expert on primary pulmonary hypertension.

Weber was a very active teenager. "I loved to play softball, and was a member of a softball team in school," she says. "But in my early 20s, I noticed I was out of breath a lot. At the same time, I was beginning to gain some weight. But I thought the reason I was out of breath was because I was gaining weight. It wasn't until I started fainting that I went to see my doctor."

Weber's doctor in Iowa had her perform several pulmonary function tests, including a treadmill test. Most healthy people in their 20s can run on a treadmill for at least 10 minutes before they feel light-headed. Weber lasted less than one minute. The results of that test, along with findings from other tests, led to her diagnosis of primary pulmonary hypertension.

Weber was lucky her condition was accurately diagnosed, says Rich, professor of medicine and director of the Center for Pulmonary Heart Disease of the Rush Heart Institute. Primary pulmonary hypertension is often misdiagnosed as anything from depression to sinusitis, mainly because there is no easy way to measure blood pressure in the lungs. "High blood pressure is easy to diagnose because blood pressure cuffs wrap nicely around a person's arm," says Rich. "But it's impossible to design a similar cuff that wraps around a person's chest."

Even though Weber's condition was diagnosed promptly, her doctor knew little about treating this rare disease. Weber was given a prescription for Cardizem, a medication used to treat high blood pressure. But high blood pressure medications usually have little effect on primary pulmonary hypertension. Because Weber would become short of breath just walking from the bedroom to her kitchen, she was also on oxygen therapy, and kept an oxygen tank next to her bed. But this helped her breathe only for a few minutes at a time, she says. The condition kept Weber homebound.

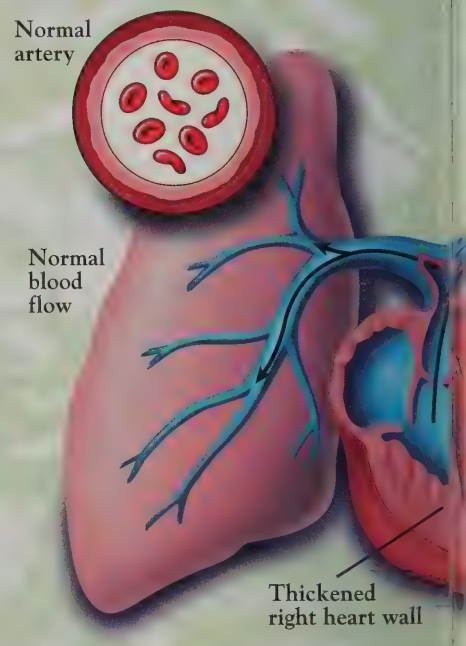


Illustration: Kristen Wienandt

Until recently, there was no specific treatment for primary pulmonary hypertension. According to Rich, until the past decade, people typically lived only two years after being diagnosed. In the early 1980s, researchers at Burroughs Wellcome, a pharmaceutical firm in Research Triangle Park, N.C., created a drug called prostacyclin, which dilates blood vessels. Researchers studied several possible uses for the drug, but its greatest success came in the treatment of primary pulmonary hypertension. Rich was one of the cardiologists who took part in the clinical trials.

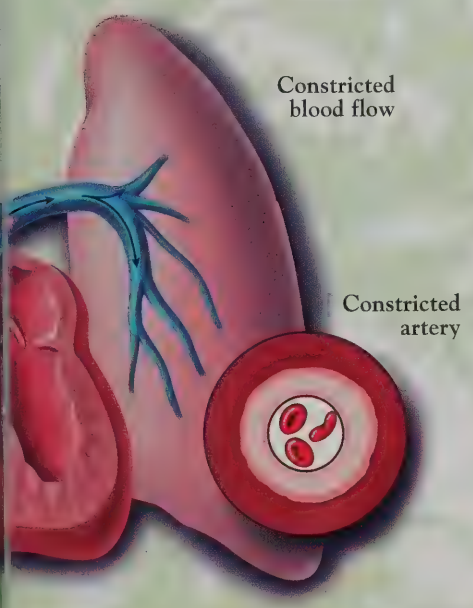
Rich has had a keen interest in the little-understood field of pulmonary hypertension since medical school. "As soon as I heard about the condition and the lack of research and treatment on it, I knew I wanted to focus my energies on studying it," he recalls.

"It's been difficult for my family and... But I come from a small town..."

iew data from the prostacyclin study
lisease to reverse in some people."

The drug study documented significant improvements in the exercise ability of the people who received continuous intravenous infusion of prostacyclin. They were able to walk longer distances, an average of 50 meters, in a given amount of time after using the drug.

But since so few people develop the condition, Burroughs Wellcome was prepared to stop production of the drug. Rich and other study physicians asked the U.S. Food and Drug Administration to approve prostacyclin as a treatment for primary pulmonary hypertension on the basis of the results. "We also begged the company to keep producing the drug," recalls Rich. "Prostacyclin was the only hope we had for treatment."



In 1995, prostacyclin became the first FDA-approved drug for primary pulmonary hypertension. It is only available at Rush and a handful of other medical centers in the United States. The company, now called Glaxo Wellcome, continues to produce prostacyclin.

According to Rich, prostacyclin works against primary pulmonary hypertension while other medications fail because it accomplishes three tasks: It eases constriction of the small arteries in the lungs, it prevents blood clotting, and it stops the thickening of the muscle walls in the arteries. Overall, prostacyclin allows blood to move more freely through a patient's arteries and lungs, allowing him or her to be more active.

Prostacyclin is administered intravenously, through a catheter surgically placed in a central vein in the patient's chest. This high-tech delivery system can now be handled at home by a patient following a nurse's instructions. Although great care must be taken to prevent infection, Weber does not consider the process too troublesome. "There is some adjusting to be done throughout the day," Weber says. "But otherwise, it's a small task to do, relative to all the benefits it gives me."

Studies show that the longest someone has survived with primary pulmonary hypertension using prostacyclin is 11 years. Rich has treated patients for up to seven years. "What's exciting now, however, is that new data from the prostacyclin study show that the drug can cause the disease to reverse in some people," says Rich. "Early detection and early administration of prostacyclin may allow patients to live much longer lives."

Prostacyclin stabilizes critically ill patients, which may allow them to undergo lung transplantation. For some people with primary pulmonary hypertension, transplantation becomes necessary over time because their lungs are steadily damaged by high blood pressure. "We consider lung transplantation to be the treatment of last resort," says Rich.

Rich does not believe Weber is at the point where she needs a lung transplant. Prostacyclin has made a profound difference in her life. Since starting on the treatment, she has not experienced

Photo: Jean Clough

Amie Weber with her husband, D.J., and son, Tyler.

any fainting spells, she no longer retains water, and her disease seems to have stabilized. But she can no longer lead the life she enjoyed just a few years ago. "Needless to say, I'm no longer playing softball or going bowling," says Weber. "I also can't do the vacuuming anymore. And I have to take the two flights of stairs to our apartment very slowly. It's been difficult for my family and friends to see me go through this. But I come from a small town where we support each other."

Many people with the disease often experience depression and feelings of isolation. What keeps Weber going is the support of her family and friends, and her faith. "God makes things happen for a reason," says Weber. "I've learned to accept what I can't do anymore and focus on what I can do." ■

riends to see me go through this.
vhere we support each other."

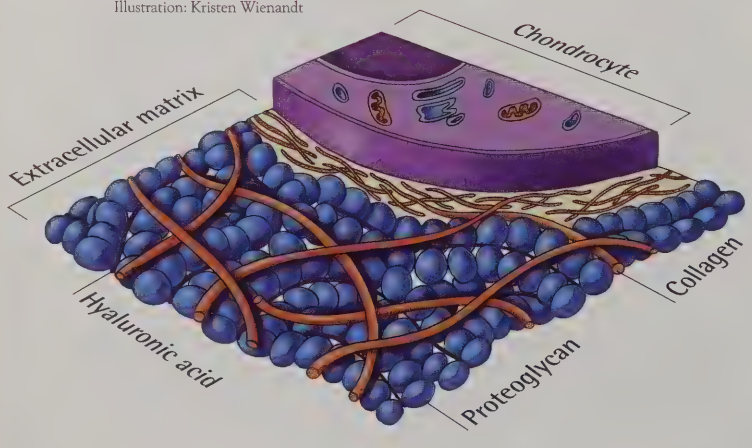
Making in the Fight Against

As Leona Shapiro remembers it, the pain began nearly 20 years ago after a morning of golf.

"I noticed a bump on one of my knuckles," says Shapiro, 76. "It was a bit sore, but I didn't think much of it. I just thought I had been holding the club wrong." Soon afterward, though, Shapiro began noticing more bumps, more redness and pain. "I didn't see a doctor until after the pain became so severe I felt like screaming every time someone shook my hand."

Shapiro is one of an estimated 16 million Americans who suffer from osteoarthritis, the most common joint disease and one of the country's leading causes of disability. Osteoarthritis is marked by the gradual destruction of cartilage, the tough yet elastic tissue that covers the ends of bones. The disease — which may appear in one joint or several — strikes senior citizens the hardest, afflicting most people over the age of 65 to some degree.

Illustration: Kristen Wienandt



Cartilage is made up of cells, called chondrocytes, surrounded by extracellular matrix. This structure allows cartilage to protect bones against the forces of impact.

by Trisha Gura

For many years, Shapiro's symptoms were partially controlled with a battery of anti-inflammatory drugs and pain relievers. But five years ago, after the disease had come to affect her knees and hips, worsening pain forced her to undergo surgery at Rush to replace a badly damaged right hip. "I don't cave in for every little thing," says the Northside Chicago retiree who worked as an office manager until just four years ago. "But it got so it hurt every step I took. And not just when I was walking — the pain was excruciating even when I turned in bed."

Today, Shapiro considers herself fortunate to be up and around with the continued aid of anti-inflammatory drugs. But her case reflects the dismal clinical outlook for those who suffer from the disease. Joint replacement surgery is an option of last resort for people with the most severe disability. Medications do little more than temper sometimes excruciating pain. To complicate matters, most osteoarthritis patients don't know they have the disease until cartilage damage is advanced, because cartilage has no nerves to signal the brain with telltale pain impulses.

"That is why osteoarthritis is such a devastating disease," says Klaus E. Kuettner, PhD, co-director of the Rush Arthritis and Orthopedics Institute. "You don't know your cartilage is gone until bone is involved."

While drug companies continue to look for new medications, Kuettner — who also heads the Department of Biochemistry at Rush — is leading a team of researchers in a different direction. He and his colleagues, supported in part by a Specialized Center of Research grant from the National Institutes of Health, are seeking clues about the detection, prevention and treatment of osteoarthritis in detailed studies of the structure and biology of cartilage.

Cartilage, explains Kuettner, has peculiarities that account for both its resilience and susceptibility to damage.

Like shock absorbers on a car, cartilage cushions the forces of impact during a lifetime of walking, running, sitting and standing. When functioning normally, cartilage is able

Strides

Arthritis

to protect the underlying bone in joints because of its unique structure: a few cells, called chondrocytes, supported by a scaffold of interconnected molecules created by the chondrocytes themselves. This so-called extracellular matrix consists of proteins — collagen and proteoglycans — linked with other molecules in an intricate and delicately balanced network that simultaneously supports and is maintained by the cartilage cells.

Why are certain joints prone to osteoarthritis while others appear to evade it?

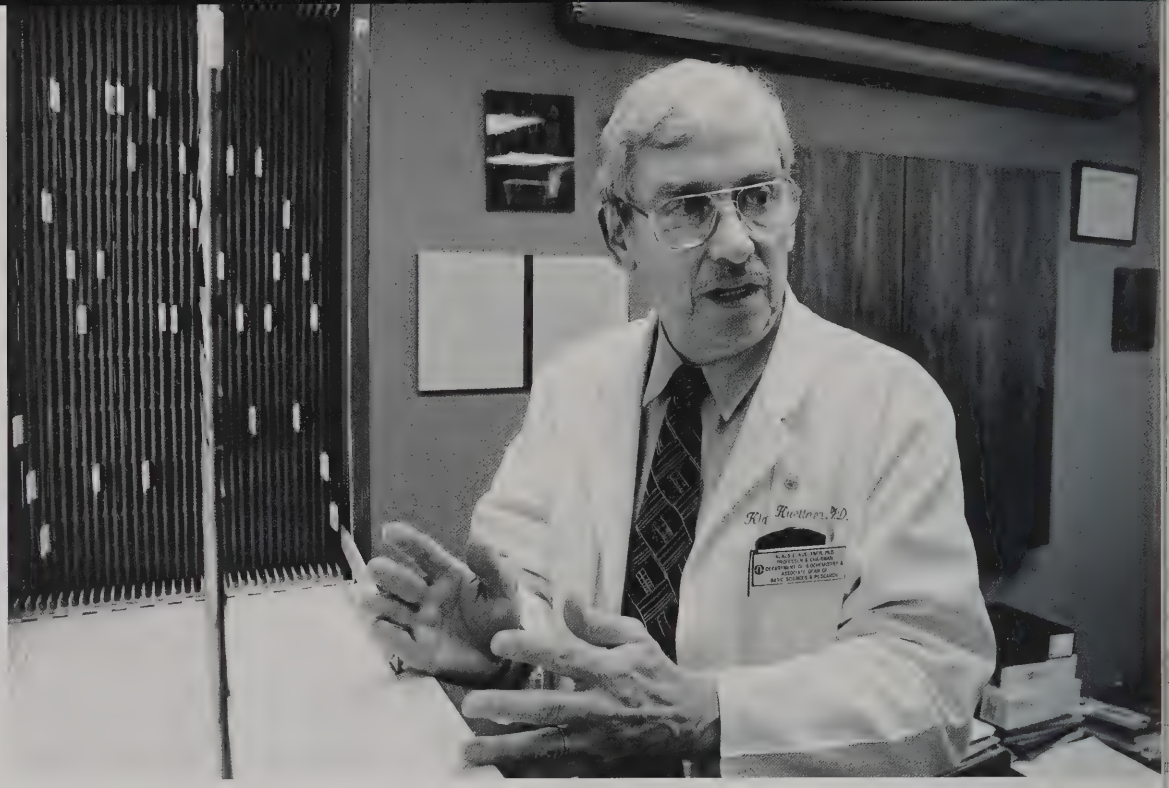
As with all supporting tissue, such as bone and skin, cartilage constantly remodels itself — tearing down its matrix, molecule by molecule, then making it anew. But such matrix rebuilding has its limits.

"Cartilage is one of the few tissues in the body that cannot adequately regenerate itself," Kuettner says. In others words, cartilage cannot repair itself the way bone does following a fracture.

Kuettner and his group are striving to understand the reasons for the tissue's limited ability to repair itself, the conditions under which cartilage becomes damaged, and biological agents that may stimulate repair. In the more than 15 years since he started his research program at Rush, Kuettner and his team have done much to increase basic scientific knowledge about cartilage and, by extension, osteoarthritis.

Much of the group's research has been conducted using cartilage from cows, which is biologically similar to human cartilage. Research on bovine cartilage has been complemented by studies of tissue samples from patients with osteoarthritis, obtained during joint replacement surgery. Three years ago the group was able to tap a wellspring of normal human cartilage: the Regional Organ Bank of Illinois.

Using tissue from the organ bank, Kuettner and his



Rush biochemist Klaus E. Kuettner, PhD, and his research team have received international recognition for their studies of osteoarthritis.

colleagues have pinpointed subtle biochemical differences between healthy and damaged cartilage.

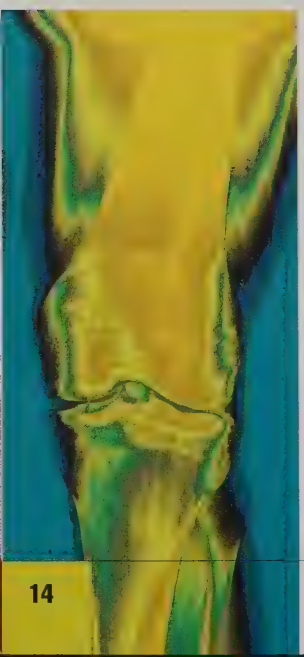
They have also been able to apply their research to a puzzle that has stumped physicians for decades: Why are certain joints prone to osteoarthritis while others appear to evade it? For instance, osteoarthritis of the knee is common, while the same damage is rare in ankles — even though both joints bear the same degree of body weight.

"Osteoarthritis was originally called a wear-and-tear disease," Kuettner says. "In some cases, abnormal wear and tear can lead to osteoarthritis. But this is not the whole story."

People who are susceptible to osteoarthritis typically develop the disease by age 55. But excessive stress to certain joints — such as knee or hip damage experienced by many competitive athletes — can bring on the disease earlier and increase its damage to specific joints. Obesity also predisposes some people to osteoarthritis.

"Practically no one gets osteoarthritis in the shoulder," Kuettner says. "But if you go out on the street and see someone using a sledgehammer, there you may see osteoarthritis in the shoulder because of the transmission of that terrible vibrating force."

Still, some people develop the disease in many joints and without apparent reason. Excessive stress to a joint — or "abnormal loading" as Kuettner calls it — does not answer all the questions about joint specificity.



"A football player may damage his knee but not get osteoarthritis," Kuettner says. "Or he may get it in the knee and not the ankle. We ask ourselves, 'What is the initiation of osteoarthritis?' The answer, we think, has to do with the specific joint."

Kuettner and his colleagues are finding clues to the joint preferences of osteoarthritis in laboratory studies of how cartilage responds to a particular growth factor, called osteogenic protein-1. Investigators fed the growth factor to chondrocytes from the cartilage of several organ bank donors. In many cases, cells began pumping out more proteoglycan and collagen molecules, the protein building blocks of a new cartilage framework.

Researchers are only now beginning to compare the effects of the growth factor on chondrocytes from different joints. "It looks as if ankle cartilage has a greater ability to repair itself," Kuettner says.

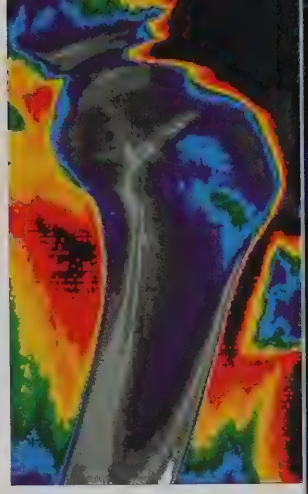
Rush researchers also are gaining insights into joint specificity through research on the flip side of cartilage remodeling — tissue breakdown.

When damaged by normal wear and tear, cartilage cells produce molecules called metalloproteinases, which digest proteins much as Drano eats through clogged pipes. Their job is to chew up cartilage matrix and, in doing so, make a space for chondrocytes to create new scaffolding.

"When cartilage is functioning normally, the two processes — breakdown and repair — work compatibly," Kuettner says. However, in the case of osteoarthritis, he believes the digestive half of the system dominates. So while tissue breakdown contin-

"'What is the initiation of osteoarthritis?' The answer, we think, has to do with the specific joint."

"...suddenly we have a growth factor in our hands, capable of inducing repair, at least in a test tube."



ues, new synthesis cannot keep up. This causes build-up of the harmful by-products of cartilage breakdown.

In laboratory studies, Kuettner's team has discovered that cartilage cells from the knee manufacture a particular tissue-gobbling protein, matrix metalloproteinase-8, while cartilage cells from the ankles of the same person do not. Only when the ankle cartilage was exposed to an inflammatory agent did the tissue begin to produce the substance.

What does all of this mean for patients with osteoarthritis?

Currently, there are no direct clinical applications of the group's research findings. But laboratory studies at Rush have, over the years, filled in many pieces of the puzzle and pointed the way to new avenues in the search for better treatments.

"We always thought that chondrocytes were dormant cells sitting there doing nothing," Kuettner says. "But suddenly we have a growth factor in our hands, capable of inducing repair, at least in a test tube."

At the same time, researchers — at Rush and elsewhere — are finding ways to stop tissue-eating molecules like the metalloproteinases present in osteoarthritis. "The pharmaceutical industry is working feverishly to make protease inhibitors," Kuettner says. Such inhibitors, which have caught the eye of AIDS researchers for other reasons, block the digestive action of metalloproteinases.

Kuettner hopes these insights will one day be the seed for osteoarthritis treatments that do more than relieve symptoms, as current treatments do, providing permanent relief for the millions who suffer.

Research seeks screening methods for osteoarthritis

While part of Kuettner's team may one day zero in on therapies that can either rebuild cartilage or arrest cartilage destruction, other researchers are studying both processes in the hopes of finding ways to diagnose the disease before cartilage damage is advanced.

"We can only detect osteoarthritis in the late stages," says Eugene J. M. A. Thonar, PhD, associate chairman for research in Rush's Department of Biochemistry.

The current method of diagnosing osteoarthritis is to measure a decrease in joint space using a special X-ray technique. Most patients don't feel pain — and therefore don't consult a doctor — until the joint space has become so small that bone rubs against bone.

"I want to develop a blood test to identify abnormalities much earlier, and to look at how the disease progresses with treatment," Thonar says.

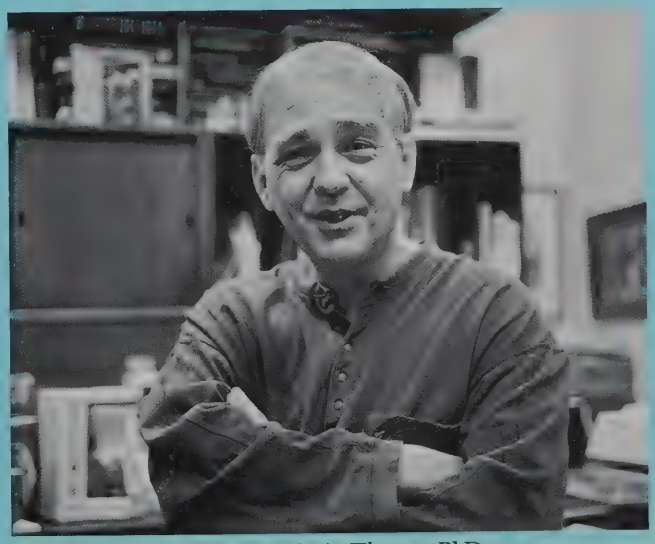
Thonar acknowledges the lack of therapies to alter the course of the disease once it is detected, but he still thinks early detection will benefit patients.

"You can tell those patients to start wearing better shoes, to lose weight and to stop participating in sports that place additional stress on the joints," he says. "Second, once you can detect osteoarthritis early, I think a lot more research will go into trying to slow it down.

"I would really like to use markers for prognosis," Thonar says. "We recently obtained evidence that such markers will enable us to distinguish between those who are going to progress rapidly and those who will not."

So far, Thonar's best results have come from measuring digested fragments of specific joint-derived proteins in blood. That approach has yielded a great deal of information so far. But there is a caveat: The liver and kidney have potent systems to help rid the body of breakdown products. As a result, an accurate blood test for the fragments is not easy to develop because all but the smallest cartilage-derived fragments are eliminated from the blood circulation before they can be measured.

"It can get rather complicated," says Thonar. "But we are very hopeful that our approach will work. Our goal is to find really good markers to help the clinician identify patients in need who can be helped by treatment."



Rush researcher Eugene J. M. A. Thonar, PhD.

Redis

For nearly a year, Cathy Sebock lived in a world of complete silence, unable to hear anything, from the roar of a passing train to the voices of the people she loves.

But today, thanks to a tiny device that acts much like a healthy inner ear, Sebock has regained the ability to perceive sounds and spoken language.

Photo: Jean Clough

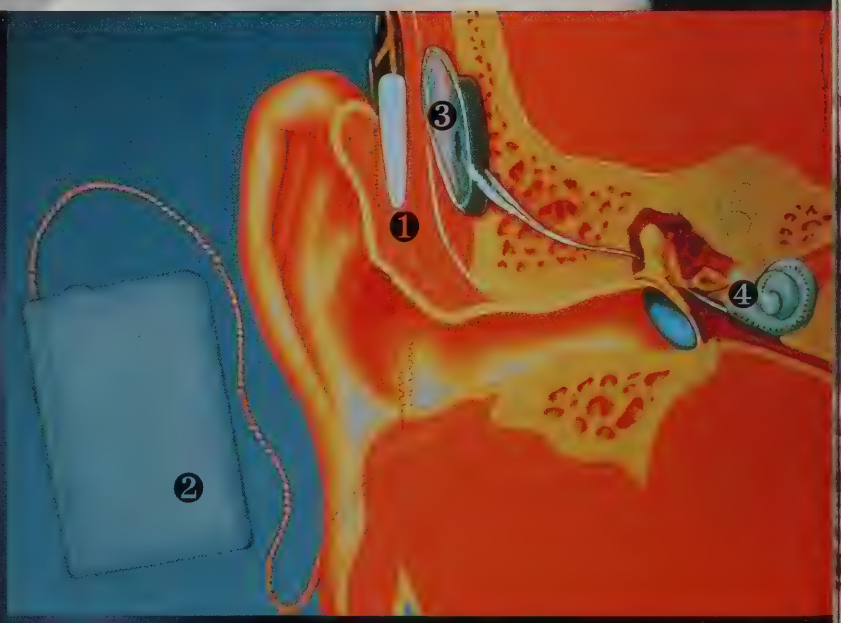
How the cochlear implant works:

❶ *Sound is received by external* ***microphone****, and*

❷ *sent to* ***speech processor****, which selects and "codes" useful sounds.*

❸ *Code is sent to implanted* ***receiver/stimulator*** *and converted to electrical signals.*

❹ *Electrical signals are sent to* ***electrodes****, which stimulate remaining nerve fibers in inner ear, allowing brain to recognize signals as sound.*



covering Sound

by Cheryl Janusz

"Cathy has done remarkably well — better than we ever expected," says neuro-otologist and otolaryngologist Robert A. Battista, MD, who heads the Rush Cochlear Implant Program. Through the program, Battista and audiologist Kimberley Austin, MA, evaluate and treat patients suffering from total and near-total hearing loss.

Some, like Cathy Sebock, are candidates for a cochlear implant, a remarkable piece of technology that can restore a person's ability to experience the world of sound.

Severe hearing loss affects more than 2 million Americans, many of whom are not helped by traditional hearing aids — tools that rely on a person's ability to hear sounds and voices to some extent. The cochlear implant is an option for people with complete hearing loss, which is often the result of nerve damage to the inner ear, or cochlea.

Photo: Bruce Powell

Robert A. Battista, MD, describes the ear's structure to a patient.

Within the cochlea is a tiny structure called the organ of Corti, lined with hairs that vibrate in response to sounds. Normally, this creates nerve impulses — or sound messages — that travel, via the auditory nerve, to the hearing center of the brain, where sound is registered and interpreted. But when nerve fibers in the cochlea are destroyed, these messages never make it to their ultimate destination. Sounds enter the ear, but are not "heard" by the brain.

Unlike a hearing aid, which amplifies sound, the cochlear implant bypasses the damaged portions of the inner ear and stimulates the remaining hearing nerve fibers with electrical signals. These signals increase the brain's ability to detect sound, acting much like nerve impulses in a healthy inner ear. "We call this effect 'sound awareness,' not hearing, because a person who receives the implant doesn't hear in precisely the same way as a person with a normal inner ear," says Battista. "But the results are still remarkable.

"At the very least, patients regain the ability to hear simple sounds, such as a car horn or a bird's chirp, that they couldn't hear at all before the implant," he says. "Many implant patients are able to speak on the telephone and enjoy music. Some are even able to carry on conversations in crowded, noisy rooms."

Cochlear implants offer benefits to many people with severe hearing loss, including those who were born deaf. But research shows that people helped most by the device are those, like Sebock, who have suffered recent hearing loss.

Sebock, who is 42, lost the hearing in her right ear in 1990 following brain surgery to remove a life-threatening blood clot. She became completely deaf in February 1996, when the hearing in her left ear was destroyed by a near-fatal bout of meningitis.

For the next eight months, Sebock struggled to cope, but learning to live without hearing brought more frustrations than successes, she recalls. She was forced to leave her job as an ambulance dispatcher. Especially devastating was her inability to understand the first words of her 2-year-old grandson, Derek. "We managed to communicate with gestures ... but I really wanted to know what he was saying," she says.

Unlike a hearing aid, which amplifies sound, the cochlear implant... stimulates the remaining hearing nerve fibers with electrical signals.

In a lip-reading class this past August, Sebock learned about the cochlear implant. Her teacher referred her to Rush, where Battista and Austin conducted an extensive evaluation and found she was an ideal candidate for the device.

In November 1996, Sebock underwent a two-hour operation, during which Battista placed the inner portion of the implant, carefully running a narrow wire through her left inner ear.

The inner ear is actually a long, fluid-filled tube that is coiled like a snail. "At different portions of the coil, you hear different frequencies," says Battista. "The implant acts in much the same way as a normal inner ear. At different points on the wire, electrodes respond to specific sound frequencies. Different parts of the inner ear are stimulated by the implant, depending on the types of sounds coming in."

Six weeks after the surgery, when the swelling around her ear had subsided, Sebock returned to Rush to meet with Austin in audiology. Austin attached the outer portion of Sebock's implant — a tiny microphone that is hooked behind the ear, along with a computerized speech processor.

The microphone is attached by wire to the processor — a box, about the size of a deck of cards, that can be worn in a pocket or clipped to a belt. "The microphone picks up sound — speech, background noise, whatever — and sends it to this box, which converts it into electrical signals," says Austin. "These signals are then sent back to the inner ear, where they are 'read' by the implant."

At first, Sebock, like most implant recipients, reported that the sounds she "heard" seemed odd, almost mechanical. "People say voices sound like they've been produced by a computer," says Austin. Throughout the months of January and February, Austin steadily reprogrammed the speech processor, increasing and decreasing sound at certain frequencies based on Sebock's feedback. This fine-tuning ultimately helped achieve a sound quality Sebock found more acceptable.

"It often takes a few months to achieve a sound quality the person is comfortable with. Plus, over time, a person's brain starts to adjust to this new type of sound, so it begins to seem more normal," says Austin. Sebock also continues to attend weekly sessions of rehabilitation therapy, in which she learns to discern subtle consonant sounds.

Because the implant's speech processor is basically a computer, it can be continually upgraded. As the technology improves, patients simply come in to have their devices reprogrammed. No additional surgeries are required.

Sebock received the Nucleus 22 Channel cochlear implant, which is currently one of just two FDA-approved devices. Battista and Austin stress that the implant is an option only for patients with severe-to-profound hearing loss who get no benefit from hearing aids.

The cochlear implant has been available to patients since 1985. Yet many people are unaware the technology exists, says Joan Josephson, Sebock's mother. "This treatment has offered her a chance to regain something that we thought was lost for good," she says. "People really need to know that this option is out there." ■

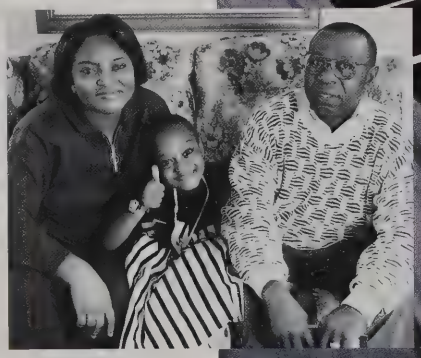
Photo: Jean Clough

Audiologist Kimberley Austin tests Cathy Sebock's ability to understand sounds after she received a cochlear implant.

TEAMING UP
against cancer

by Barbara Harfmann

Nora, 16, and Nene, 6, were diagnosed with cancer within the past year. Brought together by nurses at Rush, where they are both receiving treatment, the two friends share the experience of a life-threatening illness.



Photos by Jean Clough

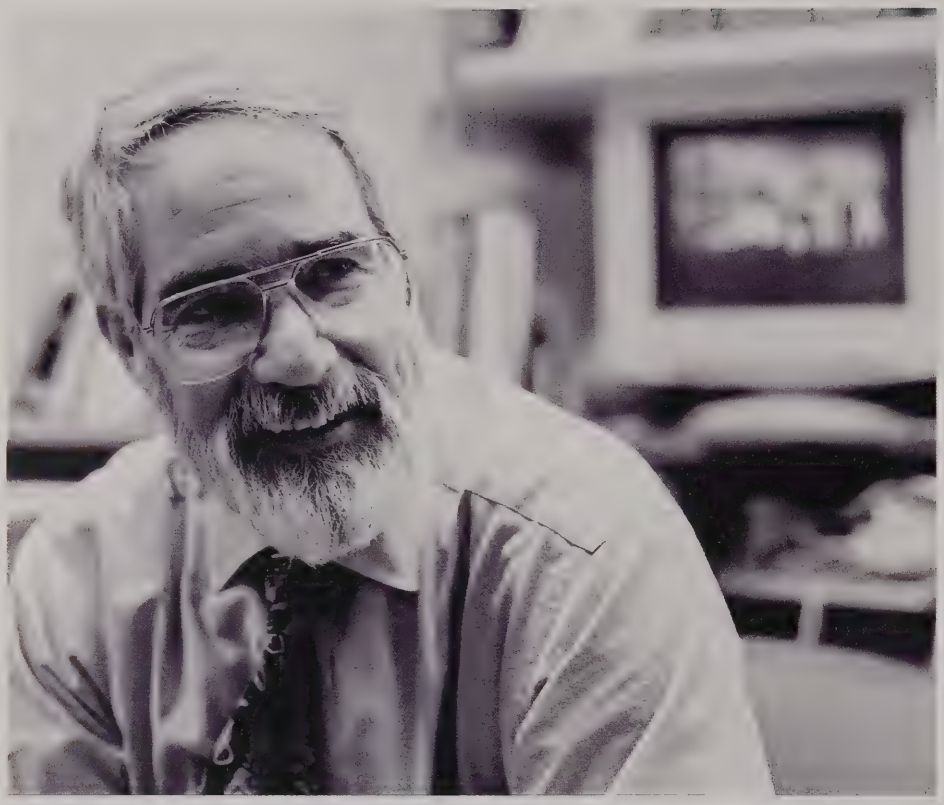
Nora Will (left) and Nene Eneogwe at the piano. Inset photo: Nene with her parents, Joy and Ishmail Eneogwe.

Watching Nora Will and Nene Eneogwe play a duet on the piano, it is clear the two girls share a special bond.

"I used to have to use a walker, too," says Nora, encouraging Nene as she takes a few steps in Nora's living room in Oak Park.

"The first time I saw Nene, her two little legs were in casts, sticking straight out in front of her," says Nora, who lives just five blocks away from her new friend. "Sitting in her wheelchair, she looked like she was on her throne, so my Mom and I nicknamed her 'Princess Nene.'

"We talked about chemotherapy and going bald. I said, 'You're going to be bald just like me.' My openness seemed to encourage her," says Nora, who was



Alexander Green, MD, director of pediatric hematology/oncology at Rush.

diagnosed with osteosarcoma, a dangerous bone tumor, in March 1996 — just one month after her 16th birthday.

The Eneogwes discovered last October that Nene has leukemia, a cancer that affects the soft tissue inside bones — the marrow — that produces blood cells. As of March, she had completed three months of a 27-month course of chemotherapy. Her chances of beating the disease are good, says the girls' physician Alexander Green, MD, who directs the Section of Pediatric Hematology/Oncology at Rush.

"Cancer is a large group of diseases, and each one is vastly different," says Green, professor of pediatrics. "That's where the challenges and misconceptions come in. The pancreatic cancer that Joseph Cardinal Bernardin had and acute leukemia in a child like Nene are two different forms of cancer, with different treatment plans and outcomes.

"Some childhood forms of acute lymphoblastic leukemia are exquisitely sensitive to treatment, with a more than 90 percent long-term cure rate — far better than when that same cancer strikes an adult," Green explains. "Also, kids seem to tolerate aggressive chemotherapy better than adults."

More than 900,000 adults are diagnosed with cancer annually in the United States, but cancer in children is much more rare, says Green. Nora and Nene are two of only about 10,000 children and young adults diagnosed with cancer each year.

Rush offers a holistic approach to the care of children with cancer. The pediatric cancer program is staffed by a team of professionals — pediatricians and nurses who specialize in cancer care, along with orthopedic surgeons, radiation therapists, radiologists, pathologists, social workers and psychologists. These specialists develop treatment plans that address the medical, social and emotional needs of young patients and their families.

"Cancer Is A Large Group Of Diseases, And Each One Is Vastly Different."

When medical tests confirmed that Nene had cancer, her parents, Joy and Ishmail Eneogwe, were overwhelmed with fear. "I had just taken her for her kindergarten physical, and everything was fine," says Joy Eneogwe, a nurse at Cook County Hospital.

Rush staff helped the family cope with the frightening diagnosis, say the Eneogwes, who have four young children, including Nene. "They reassured us that cancer can be beaten," Joy Eneogwe says.

At the head of the Rush team is Green, who joined the Rush faculty in 1988 after more than 20 years at St. Jude Children's Research Hospital in Memphis, Tenn. At Rush, he has helped build a nationally respected pediatric cancer program that offers comprehensive care for infants, children and adolescents with all forms of cancer.

An authority on the treatment of bone and soft-tissue sarcomas, Green also co-directs the Rush Sarcoma and Orthopedic Oncology Center with orthopedic oncologist Steven Gitelis, MD. This center is one of a handful of programs in the nation offering specialized care for children and adults with these rare cancers.

Less than 2 percent of all cancers are sarcomas — malignancies that arise in bone and connective tissues such as cartilage and muscle. While sarcomas can occur at any age, half of those they strike are under 16. Nora had just turned 16 when she found out she had developed osteosarcoma, a cancerous bone tumor above her right knee.

Thanks To New And More Aggressive Treatment Approaches, Osteosarcoma — A Cancer That Was Once Almost Always Fatal — Now Has A 70 Percent Cure Rate.

The cancer diagnosis was devastating for Nora, a successful athlete at Oak Park-River Forest High School. As a sophomore, she played varsity basketball and volleyball. She had dreams of a college scholarship, and of one day playing on the Olympic volleyball team.

"Sports were my life, and I couldn't believe they were being taken away from me. The only cancer I had ever heard of was lung cancer and breast cancer, and we had no family history, so I never thought I would get cancer. But then reality hit me," says Nora.

A painful leg injury forced Nora to sit out from basketball practice for five days in December 1995. She thought she had torn cartilage in her knee, but X-rays revealed a problem with her femur — the large bone that extends from the hip to the knee. Nora was referred to Rush bone tumor specialist Steven Gitelis, MD, for further tests. These tests revealed cancer.

"After the frightening diagnosis, the Rush staff reassured us that cancer can be beaten."

Nora's treatment began with chemotherapy to shrink her tumor. Then Gitelis removed eight inches of her diseased femur, including the knee joint. He replaced this bone and joint with a combination of metal and plastic.

A 1975 graduate of Rush Medical College, Gitelis is internationally recognized for his pioneering work in the treatment of musculoskeletal tumors using limb-sparing surgery. This approach can save patients like Nora significant disability, explains Gitelis. "Twenty years ago, the only treatment for a patient with this kind of bone cancer was amputation."

Nora underwent surgery in May 1996. The following months were difficult as she struggled to learn to walk again. She also received eight more months of chemotherapy to kill any remaining cancer cells — treatments that left her weak and nauseated. Throughout this ordeal, Nora tried to live a normal life. Although she couldn't play, she attended most of her school's volleyball and basketball games, encouraging her former teammates. Last fall, Nora was elected to her school's homecoming court.

With the help of a supportive family — including her mother, Wendy, her father, Corwin, and a sister and brother, Jenna, 20, and Nathan, 15 — Nora is recovering physically and emotionally. She tries not to dwell on the scars of her illness — the newfound uncertainty of life and death, the sports she can no longer play and the friends who no longer call.

"I was so angry in the beginning — always wondering, 'Why me?' But now I have accepted my disease. My faith in God has actually deepened," she says.

"Being around children with cancer and other serious illnesses has made me realize how lucky I am. Children like Nene have inspired me with their courage, and helped me to cope, through their silliness and laughter," adds Nora, who would like to eventually become a kindergarten teacher or physical therapist.

When Nora completed chemotherapy in January, she and her family celebrated with an "end of chemo" party. Nora knows her cancer could return. But she also knows that a patient's odds of beating bone cancer are better than ever. Thanks to new and more aggressive treatment approaches, osteosarcoma — a cancer that was once almost always fatal — now has a 70 percent cure rate.

A bone scan of Nora's leg in late January showed no signs of cancer. Rush physicians continue to closely monitor her condition.

Nora, meanwhile, remains confident that her family, friends and religious faith will help her face whatever the future holds. She also knows she can depend on her doctor.

"I like coaches to tell me if I need to work harder. Dr. Green is like my coach. He told me, 'You're going to get sick. You could die. It will be tough,'" says Nora.

"A lot of people are scared of the truth, but I'm not. I know what could happen. But I still think God made me an athlete because He wanted me to have the feeling of victory — the feeling I'm going to have when we beat cancer." ■

Nora Will (left) and Nene Eneogwe look at some of Nora's photos.

EIGHT NEW TRUSTEES NAMED TO BOARD

Connie Ashline, Donald Boroian, John Bowling, PhD, W. James Farrell, Dennis E. Foster, Donald Franceschini, Harvey Pyes and Karen Reid have been elected to the Board of Trustees of Rush-Presbyterian-St. Luke's Medical Center.

Ashline chairs the board of directors of Riverside HealthCare and Riverside Medical Center. Boroian is founder, chairman and chief executive officer of Francorp, Inc., an international franchise-consulting firm based in Olympia Fields, Ill. Bowling is vice chairman of Riverside HealthCare and Riverside Medical Center, and president of Olivet Nazarene University in Bourbonnais, Ill.

Farrell is chairman and chief executive officer of Illinois Tool Works. Foster is president and chief executive officer of 360° Communications. Franceschini is executive vice president of Sara Lee Corporation. Pyes is chairman of the board of Rush North Shore Medical Center and an attorney with the law firm of Pyes & Cherin. Reid served as president and past president of the Rush Woman's Board from 1986-1990.

BREAST CANCER SURVIVOR FIGHTS BACK THROUGH JAZZERCISE

Betty Palacz won her battle with breast cancer 19 years ago, but she continues to fight the disease for others.

Palacz was diagnosed with breast cancer in July 1978, at the age of 46. Thanks to prompt treatment, she is now healthy and doing her best to promote breast cancer research. On February 15, two days after her 65th birthday, Mrs. Palacz spent nearly four hours high-stepping to music at the fifth annual Jazzercise Marathon for Breast Cancer Research.

Proceeds from the marathon, which was held at 16 sites throughout Illinois and Wisconsin, support innovative breast cancer research conducted through the Rush Cancer Institute.

Jazzercisers have raised more than $1 million through the marathon since 1993. As the marathon's top fund-raiser, Palacz has single-handedly raised more than $20,000 for breast cancer research at Rush over the past five years.

"I think the Jazzercise marathon is a wonderful, wonderful thing," says Palacz, of Rolling Meadows, Ill. "We've got to find a cure for breast cancer."

With funding from the marathon, Rush medical oncologist Melody Cobleigh, MD, and her research team are searching for answers. They are studying various aspects of breast cancer risks and treatment.

An estimated 44,300 women will die of breast cancer this year. However, if a woman is diagnosed early, her chance of surviving breast cancer can be as high as 96 percent.

Palacz was diagnosed early and underwent treatment with surgery and chemotherapy. Now healthy, she hopes she can help Rush researchers find a cure for breast cancer. She credits her fund-raising success to the generosity of the people who have made pledges.

"It's been very easy for me to get donations because everyone knows somebody who's been affected by breast cancer," she says.

One of her chief supporters is her former employer, Motorola. Palacz retired from Motorola in December 1996, but the Schaumburg-based company has continued to match all the pledges she collects of $25 or more.

— S. Noe

Photo: Brian Westbury

Betty Palacz (front row, left) works out at the 1997 Jazzercise Marathon.

Edgar D. Jannotta, campaign chairman

CAMPAIGN FOR RUSH HITS $200 MILLION MARK

The Campaign for Rush was launched in 1991 with a clear vision and ambitious goal — raise $160 million in philanthropic support to ensure a strong future for the people and programs of Rush.

Five years later, the campaign has ended on a triumphant note, with $200 million raised as of December 31, 1996 — $40 million more than the original goal. The number of endowed chairs at Rush also increased from 41 to 78 over the five-year period.

"Anyone who runs this kind of campaign dreams of going over the top — and the Campaign for Rush has gone over the top in a very big way," says Edgar D. Jannotta, who chaired the campaign from start to finish. Jannotta is senior director at William Blair & Company, L.L.C., and a Rush Trustee.

Rush will use the $200 million to expand its existing patient care, education and research programs, says Rush President and CEO Leo M. Henikoff, MD.

"This funding will allow us to recruit outstanding faculty and build innovative programs, to ensure that Rush remains a leader in academic health care well into the 21st century," says Henikoff.

TWO PHYSICIANS NAMED TO ENDOWED CHAIRS AT RUSH UNIVERSITY

The Board of Trustees recently announced two appointments to endowed chairs at Rush University.

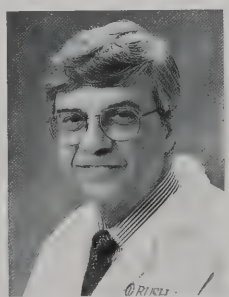
Philip D. Bonomi, MD, was named the inaugural holder of the Alice Pirie Wirtz Chair of Medical Oncology, and Sebastian Faro, MD, PhD, was appointed the John M. Simpson Professor of Obstetrics and Gynecology.

Bonomi, who is director of the Section of Medical Oncology, joined the faculty in 1977 after completing a fellowship in medical oncology at Rush. The author of more than 100 articles and book chapters, Bonomi has focused his patient care and research efforts on lung cancer.

Philip D. Bonomi, MD

Faro is chairman of the Department of Obstetrics and Gynecology at Rush. A leader in the study of gynecological infections and their treatment, Faro came to Rush in July 1996 from the University of Kansas School of Medicine, where he had served as professor and chairman of the Department of Obstetrics and Gynecology since 1992.

Faro has been editor-in-chief of the journal *Infectious Diseases in Obstetrics and Gynecology* since it was first published in 1993. He has published more than 100 articles and written 40 book chapters, as well as three textbooks.



Sebastian Faro, MD, PhD

RUSH ESTABLISHES INTERNATIONAL HEALTH SERVICES PROGRAM

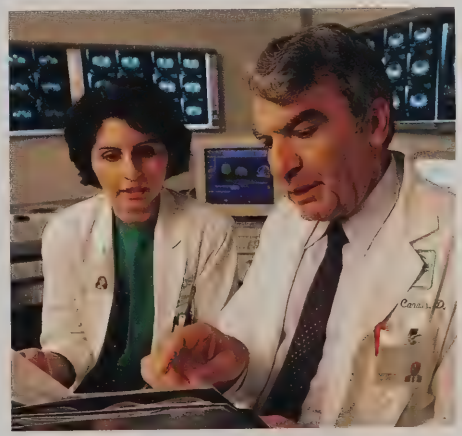
Rush recently established the International Health Services Program to address the needs of patients who come to Rush from other countries, seeking specialized medical care.

"As an academic medical center, Rush offers a wide range of advanced treatments, such as bone marrow and organ transplants, that may not be available at hospitals in patients' home countries," says Dennis Caralis, MD, MPH, the program's medical director.

"Through this program, we hope to improve global access to the excellent services and specialists that Rush has to offer," says Caralis. "Our staff coordinate all aspects of our international patients' care — from their flight into the country to the flight home — to ensure that their visits go smoothly."

Rush International Health Services staff handle travel arrangements and accommodations for patients and family members traveling from any country to Chicago. Translation and interpretation services are supplied in any language, and Rush staff act as a liaison with a patient's consulate or embassy.

Staff also schedule a patient's admission to Rush, along with all necessary medical consultations, diagnostic tests and other healthcare services. Arrangements are made, as needed, for patients who require private-nursing care or home-health services.



Dennis Caralis, MD, MPH

RUSH PEDIATRIC INTENSIVE CARE UNIT UNDERGOES MULTIMILLION-DOLLAR RENOVATION

The Rush pediatric intensive care unit has a new look. A major $4.3 million renovation has doubled the unit's size, equipped it with state-of-the-art medical technologies, and helped create a more comforting environment for young patients and their families.

Opened to patients last October, the new unit was created with suggestions from focus groups composed of patients, families and referring physicians. The new design reflects a growing realization in health care that a homelike and soothing environment can reduce the stress associated with illness — and perhaps promote faster recovery.

"The colorful artwork, natural light and calming aquariums are supportive to the quality critical care we provide to children," says Judy Salitore, MS, RN, unit director.

Patient rooms also have been updated with the latest computerized equipment so physicians can continuously monitor a child's condition. Another major change is that all rooms are private. To encourage family participation in their child's care — which is important to a child's recovery — an area is available for families and visitors who want to shower, cook meals or sleep.

"The new unit is the realization of a long-held dream," says William Hayden, MD, director of pediatric critical care. "Infants and children in medical crisis need state-of-the-art amenities in a calming, family-friendly environment."

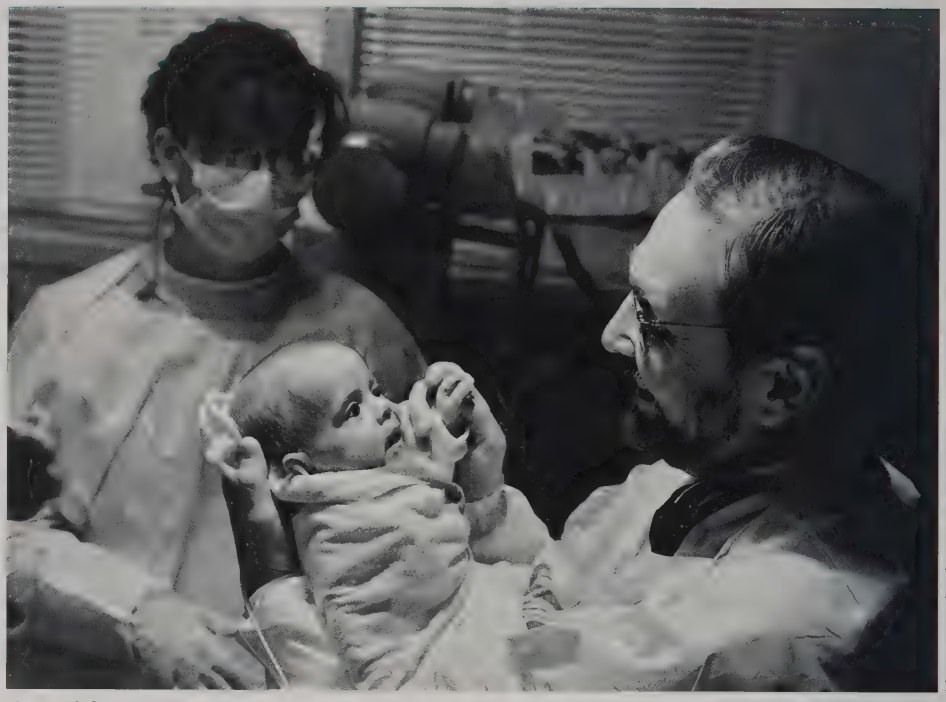


Photo: Jean Clough

One of the new unit's first patients was David McNeil, Rush's youngest heart transplant recipient, shown with pediatric cardiologist Brian Hanna, MD, PhD. David's transplant was performed by cardiac surgeon Joseph Amato, MD.

Photo: Penny Lawrence

Dr. Henikoff formally retires Oder's jersey.

DONALD R. ODER RETIRES AFTER 31 YEARS AT RUSH

After 31 years of service to Rush, Donald R. Oder retired January 15. Oder served as executive vice president and chief operating officer and as a professor in the Department of Health Systems Management at Rush University.

Oder's connection with Rush dates to the late 1950s, when he consulted at Rush as an auditor from Arthur Andersen. In 1965, James A. Campbell, MD, the Medical Center's first chief executive officer, selected Oder to be his first vice president for finance. Oder was named senior vice president in 1975, and served as acting president at Rush from 1984 to 1985, between Campbell's retirement and the selection of Leo M. Henikoff, MD, as president and CEO in 1985. In 1992, Oder was named executive vice president and chief operating officer.

Oder has held leadership positions in several healthcare organizations. He was chairman of the board of the Illinois Hospital and Health Systems Association in the early 1980s. He served as president of the first Illinois chapter of the Hospital Financial Management Association, and on the boards of several healthcare organizations. In 1990, he was named chairman of the Health Care Finance Authority's Medicare Geographic Classification Review Board.

Reflecting on Oder's retirement, Henikoff said, "Don's contribution to Rush has been unique. The institution today reflects his values of honesty, integrity and quality. He cannot be replaced."

In Memoriam

FRANK MORRELL, MD 1926-1996

Photo: Susan Richert

Pictured, from left to right, are Frank Morrell, MD, Leyla deToledo-Morrell, PhD, and Mrs. Sarah Armour. In September 1996, Dr. Morrell was appointed the A. Watson Armour III and Sarah Armour Presidential Professor of Neurological Sciences at Rush.

FRANK MORRELL, MD, an internationally known physician, scientist and teacher, died October 22, 1996, following a brief illness. Dr. Morrell was 70.

In a career that spanned more than four decades, Dr. Morrell achieved worldwide recognition for his pioneering research into the causes and treatment of epilepsy, as well as the neurological processes of learning and memory. He also was highly regarded for his work at the bedside, where he applied his scientific discoveries to improve the lives of patients with epilepsy.

Dr. Morrell was able to build bridges from the laboratory to the patient, says Jacob H. Fox, MD, chairman of neurology and co-chairman of the Rush Neuroscience Institute. "Frank Morrell was one of those rare people who had the research skills to make important discoveries, and the clinical skills to apply those discoveries to patient care," says Dr. Fox. "He was a physician-scientist in the truest sense of the word, and an irreplaceable member of our faculty."

Dr. Morrell's research has influenced the way epilepsy is treated at centers around the world, say colleagues.

"Dr. Morrell brought enormous enthusiasm, energy and a wealth of knowledge to research, patient care and teaching. His creative solutions to intractable problems combined the electrical, chemical, anatomical and behavioral aspects of brain function," says Rush neuroscientist Thomas Hoeppner, PhD, a research collaborator of Dr. Morrell's.

"The research program at Rush and the Epilepsy Center that he founded provide a powerful legacy to his lifelong commitment to neuroscience," says Dr. Hoeppner. "He set a standard to which all of us aspire."

Dr. Morrell's research interests ranged from the basic mechanisms of learning and memory to the treatment of severe epilepsy. He was a founding member of the Society for Neuroscience, a group that now has a membership of more than 25,000 scientists. In 1972, he established the Rush Epilepsy Center and served as director for the next 24 years. In September 1996, in recognition of his many achievements, Dr. Morrell was appointed the A. Watson Armour III and Sarah Armour Presidential Professor of Neurological Sciences at Rush.

Among Dr. Morrell's contributions was the discovery that certain forms of epilepsy can spread through the brain by a process called "neural learning." In this process, normal brain cells that are anatomically connected to brain cells showing epileptic activity become epileptic themselves.

In recent years, Dr. Morrell achieved worldwide recognition for developing a novel surgical procedure that offers hope to certain epilepsy patients who cannot be helped by traditional medical or surgical means. Patients who have benefited from this approach include adults and children with epilepsy that affects areas of the brain that control language or motor function.

Before joining the Rush staff in 1972, Dr. Morrell held faculty positions at the University of Minnesota, Stanford University — where he became chairman of neurology at age 33 — and New York Medical College. From medical school on, he spent many summers carrying out research at the Marine Biological Laboratory in Woods Hole, Mass.

Throughout his career, Dr. Morrell received numerous awards and honors. In addition to his accomplishments in patient care and research, Dr. Morrell was a noted teacher who trained generations of basic scientists and medical students, many of whom came to work with him from abroad.

Dr. Morrell is survived by his wife and research collaborator, Leyla deToledo-Morrell, PhD; his sister, Barbara Leeds; his children Seth (and his wife Laura), Paul, Michael, Suzanna and their mother Lenore; his aunt, Ester Citrin; and his grandchildren, Anna Rose and Daniel.

MODERN IMAGING TECHNOLOGIES UNLOCK 3,000-YEAR-OLD SECRETS OF ANCIENT EGYPT

Paankhenamun lived in ancient Egypt, a world far removed from computer technology. Yet nearly 3,000 years after his death, Rush radiologists are using a computer-imaging technique developed in recent years to learn more about this man and his society.

In life, Paankhenamun was the doorkeeper of the temple of the Egyptian god Amun, a role that earned him the honor of mummification after death. Since 1915, his mummy has rested in Chicago's Art Institute, where the hand-painted coffin is on permanent display. A priceless artifact, Paankhenamun's coffin — like most Egyptian coffins found since the early 1900s — has never been opened for fear of damaging its contents. As a result, museum staff had many questions about what is inside.

Searching for answers, Art Institute officials transported Paankhenamun to Rush last November. Here, radiology technologists took X-rays and used a technique called computed tomography — or CT scanning — to obtain detailed pictures of Paankhenamun's remains. They also scanned the jewelry and artifacts buried with him, which offer important evidence about his society's practices and beliefs.

Using CT, Rush radiologists have reconstructed a 3-D image of the mummy's head.

The union of radiology and archaeology is a logical one, says Rush radiologist Patricia Mengoni, MD. "CT, in particular, offers a wonderful way to study these coffins noninvasively to see what's inside the coffin without risk of damaging the mummy," she explains.

In CT scanning, a series of X-ray exposures — 1,000 or more, taken from various angles — are analyzed by a computer and compiled into cross-sectional and three-dimensional images of an object. "We scanned the mummy from all angles — from the sides, top and bottom," says John Connolly, MD, a radiology resident who is overseeing the project with Mengoni. "The computer then uses this information to reconstruct images that reveal incredible detail."

Mengoni, Connolly and radiologist Greg Foster, MD, are painstakingly building images of Paankhenamun's body, along with the vital organs that were preserved by mummification. So far, they have determined that Paankhenamun was about 5 feet 6 inches tall, and that he died in his early 30s — middle age for an ancient Egyptian.

The radiology team is also reconstructing detailed pictures of Paankhenamun's ornate jewelry, including a necklace, a winged amulet, and a charm in the form of a beetle, an Egyptian symbol of rebirth. "The jewelry a person was buried with offers important information about a society's beliefs and burial customs, as well as available resources," says Mengoni. "By analyzing material density with CT, we can even determine what kinds of stones and metals were used."

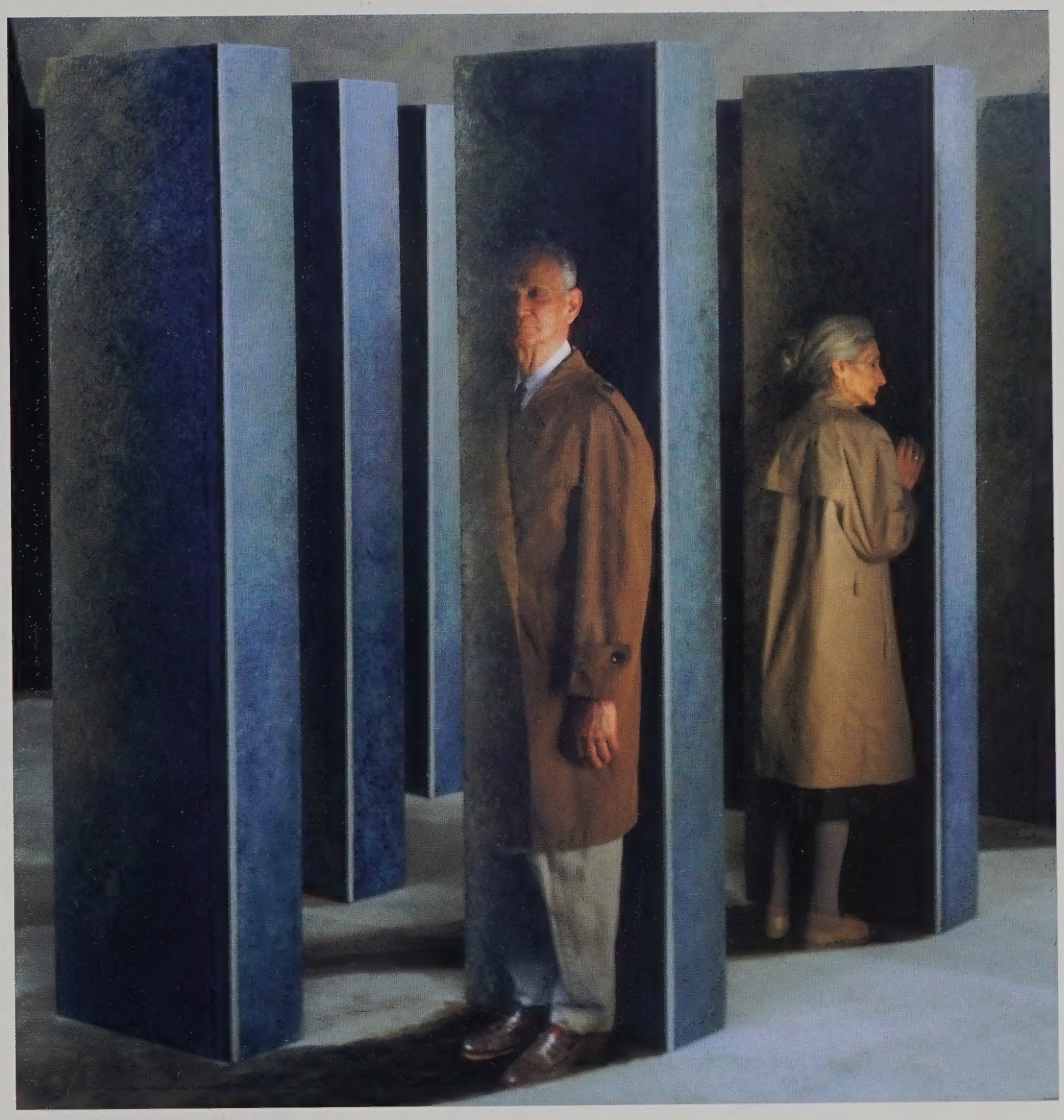
Although the procedures for examining 3,000-year-old patients aren't covered in medical school, the radiologists believe this type of work is a natural extension of what they do every day. "Basically, this is a way of using today's technologies to learn more about our own past," says Connolly.

— *C. Janusz*

Photo: Bruce Powell

Radiology technologist Ed Jones (left) leads efforts to prep Paankhenamun for a CT scan.

COMPARING MEDICATION AND THERAPY TO SUCCESSFULLY TREAT CHRONIC DEPRESSION



Prozac and other antidepressants have become well known for working miracles — helping depressed people lead happy, fulfilling lives. But a number of people with depression do not respond to medication or psychotherapy and suffer from the disease all their lives.

To assist the chronically depressed, Rush is participating in a national study to help determine the most effective treatment for these patients.

"These are especially tough patients to treat," says David Clark, PhD, research director at the Rush Institute for Mental Well-Being. "We know what to do with acutely depressed patients who respond to treatment, but with the chronically depressed, it's not as clear."

The study, which is funded by the pharmaceutical company Bristol Myers Squibb, began at Rush and 11 other U.S. hospitals last June. Approximately 660 chronically depressed people will be randomly assigned to one of three treatment groups.

One group will take a newer antidepressant drug called Serzone, which came on the market a year and a half ago. Serzone relieves depression by stimulating a brain chemical called serotonin that produces a sense of well-being. But Serzone causes potentially fewer side effects of anxiety, sleep problems or sexual difficulties than some antidepressants, says John Zajecka, MD, clinical director.

"It's important that patients are able to tolerate the antidepressants and stay on them long enough to get a response," says Zajecka. "If a patient stops taking the drug, he or she may never see the benefits."

Patients in the second treatment group will receive a new type of behavioral-cognitive psychotherapy specifically designed for people with depression. "We go over what patients have done in the past week and talk about different ways they might have behaved. Then, we send them back to experiment with these healthier ways of dealing with problems," says Clark.

The psychotherapy is designed to help patients overcome a persistent feeling of helplessness, explains Clark. "This is a core problem with these patients. They feel as if nothing they do makes a difference anymore. We're getting them to see how they can attain what they desire."

The third group of patients is taking Serzone as well as participating in psychotherapy.

By the study's end, researchers hope to identify which of the three treatments is more effective—medication, therapy or the combined approach. They will also study whether patients with specific symptoms respond better to one therapy over the others.

The study's treatment phase will last 12 weeks and will be followed by a 16-week continuation phase to prevent relapse. Patients will then enter a year-long maintenance therapy to prevent further episodes of depression.

For more information, call (312) 942-3532.

— *M. Kennedy*

KEEPING DANCERS ON THEIR TOES

Jeff Schiltz checks a dancer's back muscles.

Dancer Jeffrey Hancock receives an ultrasound treatment from Donna Williams (middle) and Trish Corich.

Photos by Bruce Powell

For professional dancers, pain is an occupational hazard. When chronic shoulder pain made it difficult for Jeffrey Hancock to dance, he knew he needed help fast.

Hancock sought help from a team of five Rush physical therapists. Once a week, they attend a rehearsal of River North Dance Company to give advice and therapy for dancing injuries.

"You could see that Jeff was in pain. We watched him dance, and it was clear that his shoulder was very unstable," says physical therapist Trish Corich. Therapists taught Hancock strengthening exercises to ease the strain, but they felt that his injury required the attention of a physician. The team referred him to Anthony Romeo, MD, a Rush orthopedic surgeon who specializes in sports injuries. Romeo discovered that Hancock's shoulder was actually coming out of the socket when he danced — a condition, caused by overstretching, called subluxation.

Under some circumstances, surgery is recommended for subluxation. But for Hancock, the long recovery time after surgery and subsequent movement restrictions would have meant an end to his dancing career.

His only alternative was to tackle the problem through physical therapy and a strict exercise regimen. "We gave him specific exercises for the subluxation, and pointed out movements that would exacerbate the problem," says Corich. "We showed him other ways to perform the same motions by keying into specific muscle groups to avoid irritation. He's doing a lot better now. He's stronger, and the pain is down."

"Ballet is a horrible strain to the body," says physical therapist Donna Williams, whose daughter, Robyn, is a dancer with the company. "Dancers are not as flexible as you'd think. Their muscles become imbalanced — flexible in one area and tight in another. That sets up your body for injury." The team works to correct these imbalances by showing dancers how to focus on using muscles they don't use as often.

For professional dancers, the show must go on. Because of this, team therapists have learned to assess problems quickly. "We don't have the luxury of time. We can't tell injured dancers to rest up if they have a performance that weekend," says physical therapist Bridget McNamara. "So it's our job to teach them how to perform without injuring themselves more."

— *L. Spengler*

RUSH

Rush-Presbyterian-St. Luke's Medical Center
1700 West Van Buren, Suite 250
Chicago, Illinois 60612

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